REMARKS

Claims 1 and 3-16 are pending in this application, claim 2 having been canceled and claims 9-16 having been added. Claims 1 and 9 are the independent claims.

Claims 1-8 stand rejected under 35 U.S.C. 102(e) as being anticipated by Shimojoh, U.S. Patent No. 6,606,188. This rejection as it applies to the pending claims are hereby traversed for at least the following reasons.

Claim 1 has been amended to incorporate the limitations of original claim 2. As discussed below, claim 1 as amended is believed to be patentable over the cited references.

Claim 1 now recites that *a first passive coupling arrangement* [is provided] *for conveying excess pump energy that traverses the optical amplifiers in the first and the second optical fibers to the third and the fourth optical fibers at a location upstream from the optical amplifiers supplying amplification to optical signals traversing the third and the fourth optical fibers.* As shown in the embodiment of the invention depicted in FIG. 2 of the application, excess or unused co-propagating pump power that traverses rare-earth doped fibers 114_1 and 116_1 and continues downstream (e.g., in the eastbound direction) along fibers 110_1 and 112_1 is transferred to fibers 110_2 and 112_2, where the excess power travels downstream (e.g. in the westbound direction) to co-pump rare-earth doped fibers 114_2 and 116_2. This transfer or recycling of pump power is achieved by a passive coupling arrangement that includes coupling elements 210_1, 210_2, 220_1 and 220_2 and 2x2 combiner/splitters 270 and 280.

In rejecting original claim 2, the examiner notes that Shimojoh discloses in FIG. 7 a pump controller 10. Applicants respectfully submit that the pump controller 10 does not serve to convey excess pump energy from the fibers in which signals travel in one direction to those fibers in which signals travel in the other direction. Rather, controller 10 is used to monitor the total output power received by light receiving sections 8 (i.e., detectors). Based on the value of the total output power, the controller adjusts the output power provided by the light sources 1 (see column 9, lines 33-38). Shimojoh does not show any arrangement for conveying excess pump energy from the fibers in which signals travel in one direction to those fibers in which signals travel in the other direction.

Accordingly, for at least this reason Applicants respectfully submit that claim 1 as amended is patentable over Shimojoh.

New claim 9 is similar to original claim 1 except that it now recites that the first combiner distributes *substantially all* of the pump energy it receives from the first plurality of pump sources to the optical amplifiers in the first and second optical fibers. Likewise, claim 9 also recites that the second combiner distributes *substantially all* of the pump energy it receives from the second plurality of pump sources to the optical amplifiers in the third and fourth optical fibers. That is, in the embodiment of the invention depicted in FIG. 1, combiner 150 distributes substantially all of the pump energy from pump lasers 120_1 and 120_2 to fibers 110_1 and 112_1, which fibers support signals traveling in a first direction. Likewise, combiner 160 distributes substantially all of the pump energy from pump lasers 130_1 and 130_2 to fibers 110_2 and 112_2, which fibers support signals traveling in a second direction.

In contrast to the present invention as set forth in claim 9, Shimojoh shows in FIG. 2 combiner arrangements in which only a fraction of the pump energy they each receive from the pump sources is provided to fiber pairs that support signals traveling in a common direction. For example, only a portion of the pump energy from sources 1_1 and 1_2 is provided to fibers S_{1U} and S_{2U} by couplers 2_1 and 2_3. The remaining fraction of the pump energy from sources 1_1 and 1_2 are provided to fibers S_{1D} and S_{2D} by couplers 2_1 and 2_4. Accordingly, Shimojoh does not show or suggest a first (second) combiner that distributes substantially all of the pump energy it receives from the first (second) plurality of pump sources to the optical amplifiers in the first (third) and second (fourth) optical fibers. For at least this reason it is respectfully submitted that claim 9 and the claims that depend therefrom are patentable over Shimojoh.

Conclusion

In view of the foregoing, it is believed that the application is now in condition for allowance and early passage of this case to issue is respectfully requested. If the Examiner believes there are still unresolved issues, a telephone call to the undersigned would be welcomed.

Serial No.: 10/646,351

Fees

If there are any fees due and owing in respect to this amendment, the Examiner is authorized to charge such fees to deposit account number 50-1047.

Respectfully submitted,

Stuart H. Mayer
Registration No. 35,277

Attorney for Applicant
Mayer Fortkort & Williams PC
251 North Avenue West, 2nd Floor
Westfield, NJ 07090
(908) 518-7700 Tel.
(908) 518-7795 Fax

Certificate of Facsimile Transmission

I hereby certify that this correspondence and any document referenced herein is being sent to the United States Patent and Trademark office via Facsimile to: 703-872-9326 on 10/29/04.

Marjorie Scariati
(Printed Name of Person Sending Correspondence)

(Signature)